**Unit 4: Quiz # 2**

K /14

**Chapter 7 – Solubility and Reactions**

**Multiple Choice (6 marks)**

1. What are the spectator ions in the reaction

Ba2+(aq) +2NO3-(aq) +2Na+(aq) + SO42-(aq) → BaSO4(s) +2Na+(aq) +2 NO3-(aq)

1. Ba2+ (aq) +NO3- (aq)
2. Na+(aq) +SO42- (aq)
3. Na+(aq) +NO3-(aq)
4. Ba2+(aq) +SO42-(aq)
5. The mass of solid lead(II) nitrate, Pb(NO3)2, required to prepare 125 mL of 0.4 mol/L solution of lead(II)nitrate is:
6. 13.5 g (b) 16.6 g (c) 41.4 g (d) 331 g

3. Which term would best describe 40 g of NH4Cl dissolved in 100 mL of water at 30ºC?

|  |  |  |  |
| --- | --- | --- | --- |
| a. | Supersaturated | d. | Saturated |
| b. | Insoluble | e. | subsaturated |
| c. | Unsaturated |

4. In water softening, an ion exchange process occurs in which

|  |  |
| --- | --- |
| a. | two Na+ ions are replaced by one Ca2+ ion |
| b. | one Na+ ion is replaced by one Ca2+ ion |
| c. | two K+ ions are replaced by one Ca2+ ion |
| d. | none of the above |
| e. | both a and c  Which o |

5. Secondary treatment of wastewater involves

|  |  |  |  |
| --- | --- | --- | --- |
| a. | Distillation | d. | large expenses |
| b. | aeration and chlorination | e. | reverse osmosis |
| c. | Filtering |

6. Based on the solubility curve, \_\_\_\_\_ KNO3/100 mL of water at \_\_\_\_\_ would be a supersaturated solution.

|  |  |  |  |
| --- | --- | --- | --- |
| a. | 30 g , 10ºC | d. | 100 g , 60ºC |
| b. | 50 g , 40ºC | e. | 100 g , 70ºC |

8. Consider the following reaction: Barium chloride solution is mixed with potassium sulphate solution to produce a solid precipitate barium sulphate and a solution of potassium chloride. For this reaction, write: [3 marks]

a) a balanced chemical equation

b) a total ionic equation

c) a net ionic equation

9. 100 mL of 0.20 mol/L sodium carbonate solution and 200 mL of 0.10 mol/L calcium nitrate solution are mixed together. Calculate the mass of calcium carbonate that would precipitate and the concentration of the sodium nitrate solution that will be produced.

[5 marks]

500 g of copper metal is reacted with 2.5 L of 3.0 mol/L nitric acid solution. Calculate how much of the copper metal remains after the reaction is complete.

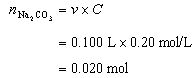
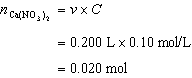
**ANSWER KEY**

6. ANS:

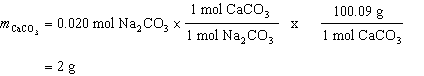
Na2CO3(aq) + Ca(NO3)2(aq) -----🡪 CaCO3(s) + 2NaNO3(aq)

|  |  |  |  |
| --- | --- | --- | --- |
| 100 mL | 200 mL |  |  |
| 0.20 mol/L | 0.10 mol/L |  |  |

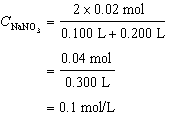


Since one mole of Na2CO3 reacts completely with one mole of Ca(NO3)2 from the equation, then this mixing of solutions will be a complete reaction.



**The mass of calcium carbonate that precipitates is 2 g.**



**The concentration of the sodium nitrate solution is 0.1 mol/L.**

REF: I OBJ: 7.6 LOC: SS2.08